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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Hugh James O'Donnell
Serial No.: 10/522,191
Filed: 01/25/2005
Group Art Unit: 1794
Examiner: Gray, Jill M.
Title: ELEVATOR BELT ASSEMBLY WITH PRESTRETCHED
SYNTHETIC CORDS

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Appellant now submits its brief in this appeal. Payment in the amount of \$30.00 (the difference between the current appeal brief fee and the \$510.00 previously paid in this case) is made by the enclosed credit card authorization form. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

Real Party in Interest

Otis Elevator Company is the real party in interest. Otis Elevator Company is a business unit of United Technologies Corporation

Related Appeals and Interferences

There are no related appeals or interferences.

Adjustment date: 06/11/2009 JYONG1
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Claims 1-4 and 6-16 are pending and on appeal. Claim 5 has been cancelled.

Claims 1, 5, 7-8 and 10 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication 2003/0092524 (the *Baranda, et al.* reference).

Claims 7-10 stand rejected under 35 U.S.C. §102(b) as being anticipated by PCT Patent Publication WO 01/14630 (the *Prewo* reference).

Claims 2-4, 6, 9 and 11-12 stand rejected under 35 U.S.C. §103 as being unpatentable over the *Prewo* reference.

Status of Amendments

There are no unentered amendments.

Summary of Claimed Subject Matter

Appellant's claims include independent claims 1, 7 and 13. Those claims are reproduced with references to the specification and drawings to demonstrate how the claims read on an example embodiment. The drawings within which the reference numbers are found are Figures 1-3.

Claim 1 recites:

1. A method of making an elevator belt assembly (40) having a plurality of cords (42) within a jacket (44) (Page 3, lines 9-10; page 4, line 7), comprising the steps of:
 - (a) aligning the plurality of cords in a selected arrangement (page 6, line 7);
 - (b) tensioning the cords a selected amount to stretch and increase a length of the cords (page 6, lines 8-9); and
 - (c) applying a selected jacket material comprising a substantially noncompressible urethane to the cords to encase the cords in the jacket so that the cords remain stretched within the jacket (page 7, line 9 and 12-14).

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Dependent claim 2 is argued separately. Claim 2 includes having the cords 42 tensioned using a load that exceeds an anticipated greatest load that the belt assembly will experience once installed in an elevator system (page 6, lines 10-12).

Dependent claim 3 is argued separately. That claim recites that the cords 42 are tensioned using a load corresponding to a desired percentage of a breaking strength of the cords 42 (page 6, lines 8-10).

Claim 4 is argued separately and it recites that the load corresponds to at least approximately ten percent of the cord breaking strength (page 6, lines 12-13). Pre-stretching the cords 42 at the ten percent of the breaking strength level is selected in one example because elevator safety codes require safety factors typically in the range from 10:1 up to 12:1. Pre-stretching the cords at the ten percent level results in belts with little or no elastic stretch and no construction stretch. In other words, the belt design typically allows for up to a ten percent stretch so that the belt design meets safety codes. By pre-stretching at the ten percent level, when the belt is placed in service after being installed in an elevator system, there is essentially no stretch during system operation.

Independent claim 7 recites:

7. An elevator belt assembly (40), comprising:
a plurality of cords (42) that are stretched to an increased length (page 3, lines 9-14); and
a jacket (44) comprising a substantially noncompressible urethane over the stretched cords that keeps the cords stretched a desired amount without any external load applied to the belt assembly (page 7, lines 12-14; page 8, lines 1-4).

Claim 11 is argued separately and it recites that the cords 42 are stretched an amount corresponding to a load that exceeds an anticipated greatest load that the assembly 40 will experience once installed in an elevator system (page 6, lines 10-12).

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Claim 12 is argued separately and it recites that the cords are stretched an amount corresponding to a load that is at least approximately ten percent of the cord breaking strength (page 6, lines 12-13).

Independent claim 13 recites:

13. An elevator belt assembly (40) made by the process, comprising the steps of:

(a) aligning a plurality of cords (42) in a selected arrangement (page 3, lines 10-11);

(b) stretching the cords by applying a selected amount of tension to increase a length of the cords (page 6, lines 8-10); and

(c) applying a selected jacket material comprising a substantially noncompressible urethane to the stretched cords to encase the cords in the jacket (44);

wherein the cords remain stretched within the jacket without any external load applied to the belt assembly (page 7, lines 12-14).

Grounds of Rejection to be Reviewed on Appeal¹

Claims 1, 7-8, 10 and 13-16 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication 2003/0092524 (the *Baranda, et al.* reference).

Claims 7-10 and 13-15 stand rejected under 35 U.S.C. §102(b) as being anticipated by PCT Patent Publication WO 01/14630 (the *Prewo* reference).

Claims 1-4, 7-9 and 11-13 stand rejected under 35 U.S.C. §102(b) as being anticipated by US Patent No. 1,412,310 (the *Lambert* reference).

Claims 1-3, 6 and 11 stand rejected under 35 U.S.C. §103 as being unpatentable over the *Prewo* reference in view of US Patent No. 3,441,641 (the *Roberts* reference).

¹ Some of the rejections in the final action indicate that claim 5 is rejected on that basis but that claim has been cancelled.

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None of the references disclose or in any way suggest Appellant's concept of pre-stretching cords in an elevator belt assembly to increase a length of the cords during an assembly process. In some of Applicant's claims the pre-stretched and lengthened cords are encased in a jacket such that the cords remain in a stretched condition even absent any external load applied to the belt assembly. As there is nothing in the cited references that in any way suggests stretching cords in that manner to provide a belt assembly that has pre-stretched and lengthened cords within it before the belt assembly is installed in an elevator system, all of Appellant's claims must be allowed.

The Examiner has taken the position that any tension whatsoever placed on a cord will "stretch" the cord and "increase its length." Appellant respectfully submits that such an interpretation of the references applied against Appellant's claims is not reasonable and should be reversed.

**The rejection of claims 1, 7-8, 10 and 13-16
under 35 U.S.C. §102(e) as being anticipated
by U.S. 2003/0092524 (the *Baranda, et al.* reference)
must be reversed.**

The Examiner equates *any* tension on a cord with stretching a cord to increase its length. That is not a reasonable interpretation. Even a rubber band can be placed under tension without stretching it to increase its length. Surely, a robust structure such as a cord in an elevator load bearing member can be tensioned without being stretched sufficiently to increase its length. The Examiner's position is not supported by a reasonable interpretation of the references.

It is not reasonable to interpret a reference that does not in any way suggest a tension or load sufficient to stretch a cord or to increase its length in a manner that leads to a conclusion that such a reference would anticipate any of Appellant's claims.

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There is nothing in the *Baranda, et al.* reference that in any way indicates that any cords are stretched or lengthened during a process of making an elevator belt assembly. The *Baranda, et al.* reference teaches applying tension to the cords in a manner that controls the spacing of the cords from the exterior surface of the jacket that encases the cords during the manufacturing process in that reference. It is noteworthy that the *Baranda, et al.* reference is directed to a technique of making an elevator belt assembly that does not rely upon cord supports during the manufacturing process to avoid forming grooves in the exterior of the jacket. Instead of supporting the cords with a physical structure underneath the cords during a jacket application process, the *Baranda, et al.* reference teaches controlling tension on the cords to keep them straight enough to achieve a desired alignment within the jacket.

Importantly, the second step of claim 1 includes *stretching and increasing a length* of the cords. Merely applying tension to a cord is not sufficient to stretch the cord. Tension must be applied at a sufficiently high level to stretch and increase a length of the cords according to Applicant's invention. There is no *prima facie* case of anticipation because the *Baranda, et al.* reference is silent regarding any stretching or lengthening of the cords in that reference.

The Examiner's position that "any degree of stretching would necessarily increase the length of the cord" is inapposite to the analysis, in part, because the *Baranda, et al.* reference never discusses stretching at all. At most, a small amount of tension is applied to hold a cord straight.

Keeping a cord straight is not the same thing as stretching and increasing a length of the cord as recited in Appellant's claims. For example, holding two ends of a cord without tension might allow the cord to sag in the middle depending on the distance between the two ends. Applying some tension in that scenario would eventually raise the lowest point of that sag until

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the cord was held straight between the two ends. A sufficient amount of tension to hold the cord straight in that manner would not necessarily stretch the cord and certainly would not increase a length of the cord.

There is nothing in the *Baranda, et al.* reference that in any way indicates that any of the tensions applied in that reference would cause the cords to be stretched or their lengths to increase. Tensioning the cords for maintaining them in a straight or desired alignment during a belt manufacturing process is not the same as and does not in any way suggest stretching the cords or increasing their lengths during a belt making process.

The only mentioned tension in the *Baranda, et al.* reference is 50 Newtons (e.g., 50 Kgm/s²). If the cords of an elevator belt would stretch and become longer when subjected to a 50 Kg load (e.g., about 100 pounds), then that belt could not reasonably be expected to support the substantially greater weight of an elevator car, counterweight and multiple passengers in an acceptable manner. Stretching in response to such a relatively light tension or load would render the belt unsatisfactory for its intended purpose. Such a hypothetical belt would not be able to reliably support the significantly higher loads of the elevator system.

It follows that the tension applied in the *Baranda, et al.* reference does not rise anywhere near the level of a load sufficient to prestretch a cord and increase its length as claimed by Appellant. In other words, it is not possible to find any stretching or lengthening of the cords in the *Baranda, et al.* reference.

Without an express teaching in the *Baranda, et al.* reference that the cords are stretched and their length is increased, there is no *prima facie* case of anticipation. The rejection must be reversed.

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PA-000.05025-US**Claims 7 and 13 are separately patentable.**

Claims 7 and 13 each include the jacket, which comprises a substantially noncompressible urethane, keeping the cords stretched a desired amount without any external load applied to the belt. There is no indication whatsoever in the *Baranda* reference regarding such an arrangement. That additional limitation in claims 7 and 13 is another, separately dispositive, reason why there is no *prima facie* case of anticipation against claim 7 or 13. The rejection must be reversed.

Claim 8 is separately patentable.

Claim 8 specifically recites that the belt assembly "has limited elastic stretch." Pre-stretching the cords limits any amount of elastic stretch that would be possible if the cords had not been pre-stretched during the assembly process. The belt assembly of the *Baranda, et al.* reference would have elastic stretch that would occur once such a belt assembly is installed in an elevator system. The loads on the belt cause stretching during service in an elevator system with most belt arrangements. The arrangement recited in Appellant's claim 8, on the other hand, has limited elastic stretch because the cords have already been stretched a desired amount during the assembly process and the jacket over the stretched cords keeps the cords stretched the desired amount even without any external load applied to the belt assembly. There is nothing in any of the cited references that discloses a belt assembly that has limited elastic stretch. The rejection of claim 8 has to be reversed.

**The rejection of claims 7-10 and 13-15 under 35 U.S.C. §102(b)
as being anticipated by the PCT Patent Publication WO 01/14630
(the *Prewo* reference) must be withdrawn.**

There is no *prima facie* case of anticipation. Claim 7 recites that the cords are stretched to an increased length and that the jacket over the stretched cords keeps the

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cords stretched without any external load applied to the belt assembly. Claim 13 has similar limitations.

The *Prewo* reference is silent regarding any stretching of the cords during a manufacturing process such that the cords are maintained in a prestretched condition within the jacket without any external load. The only possible interpretation of how the cords of the *Prewo* reference are stretched is based on the reference's discussion of how a steel cord may break before a synthetic cord. That would only happen while the cords are in use in the elevator system. Additionally, it would require that the jacket would be stretched along with the cords (if they were stretched and lengthened at all while in use) because the cords are fixed within the jacket. In other words, the only possible mentioning of anything in the *Prewo* reference that even reasonably relates to stretching of the cords is related to breaking of the cords during use in an elevator system. That will only occur when the cords are subjected to an external load.

It is not possible for the jacket of the *Prewo* reference to keep the cords stretched without any external load applied to the belt assembly. The only stretching (if any) mentioned in the *Prewo* reference occurs as a result of an external load (e.g., the elevator) being applied to the belt of the *Prewo* reference.

It is impossible to find any mention of a relationship between the cords and jacket in the *Prewo* reference that corresponds to having the cords stretched and the jacket keeping the cords stretched without any external load applied to the belt assembly within the *Prewo* reference. Therefore, there is no *prima facie* case of anticipation.

Claim 13 is a product by process claim and the resulting product has characteristics that are patentably distinct from the "product" of the *Prewo* reference. There is nothing in the *Prewo*

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reference that teaches, "the cords remain stretched within the jacket without any external load applied to the belt assembly," as recited in claim 13. In other words, the product itself is patentably distinct from the teachings of the *Prewo* reference. That reference only potentially has some indication of stretch in the context of an external load being applied and is silent how there would be any maintenance of a pre-stretched condition from a manufacturing process without any external load.

Claim 8 is separately patentable.

As discussed above, claim 8 specifically recites that the belt assembly has limited elastic stretch. The type of breaking mentioned in the *Prewo* reference and discussed above would only occur subsequent to elastic stretch while the belt is in use in the *Prewo* reference. In other words, the only possible reasonable interpretation of the *Prewo* reference is that it would experience significant elastic stretch. Therefore, it cannot be interpreted as teaching a belt assembly that has limited elastic stretch because it does not teach a belt assembly having cords pre-stretched and maintained in a stretched condition without any external load applied to the belt assembly as required by Appellant's claim 8. The rejection of claim 8 based upon the *Prewo* reference must be reversed.

**The rejection of claims 1-4, 7-9 and 11-13
under 35 U.S.C. §102(b) as being anticipated
by US Patent No. 1,412,310 (Lambert) must be withdrawn.**

The *Lambert* reference does not include using a noncompressible urethane material as a jacket. Instead, layers of fabric are laid between layers of cords in that reference. None of the claims are anticipated because independent claims 1, 7 and 13 each expressly recite a jacket comprising a substantially noncompressible urethane. Without that, the *Lambert* reference cannot possibly anticipate any of Appellant's claims.

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**The rejection of claims 2-4, 6, 9 and 11-12
under 35 U.S.C. §103 based upon the *Prewo* reference
and the *Roberts* reference must be withdrawn**

There is no *prima facie* case of obviousness. Even if the proposed combination could be made, there is nothing that corresponds to or suggests stretching cords in a manner that increases a length of the cords as recited in Appellant's claims. The rejection must be withdrawn.

The *Prewo* reference does not provide any indication of any tension on the cords to stretch the cords to increase their length in connection with applying a jacket material to the cords. Nor is there any mention of the cords remaining stretched within the jacket without any external load applied to them. There is nothing within the *Prewo* reference regarding tensioning the cords at all. There is nothing in the *Roberts* reference that teaches stretching or increasing a length of the cords. Instead, the only tension is that reference is to hold the cords straight. Therefore, it is impossible to make the leap to the techniques recited in Appellant's claims. It is not possible to establish a *prima facie* case of obviousness based on the *Prewo* and *Roberts* references without attributing features to them that are not there and using improper hindsight to somehow justify finding a reason to utilize particular tension loads to achieve something that the references never discuss (e.g., prestretching cords to increase their length and applying a jacket to them).

Additionally, claim 1 specifically recites that the jacket material encases the cords and maintains them stretched within the jacket. There is nothing within the *Baranda, et al.* reference that suggests pre-stretching cords and then applying a jacket material such that the cords remain in that stretched (e.g., elongated or lengthened) condition within the jacket.

In the case of claim 7, the jacket over the stretched cords keeps the cords stretched the desired amount without any external load applied to the belt assembly. There is nothing at all

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within the *Baranda, et al.* reference that in any way suggests that cords are maintained in a stretched condition absent an external load applied to the cords. In other words, the belt assembly of Appellant's claim 7 has cords that are already stretched a desired amount before the belt assembly is subjected to any load while supporting an elevator car in an elevator system. There is nothing at all within the *Baranda, et al.* reference that can be reasonably interpreted to suggest such an arrangement. The cited references are entirely silent on this feature of Appellant's claims.

Claims 2 and 11 are separately patentable.

Claims 2 and 11 specifically recite that the cords are tensioned using a load that exceeds an anticipated greatest load that the belt assembly will experience once installed in an elevator system. There is nothing whatsoever within the *Prewo* reference or any of the other cited references that in any way corresponds to making an elevator belt assembly and tensioning cords to stretch them using a load of the type recited in claims 2 and 11. As explained, for example, on page 6, lines 7-20 of Appellant's specification, using a load of the type recited in claims 2 and 11 results in essentially no belt stretch during elevator system operation (e.g., once the belt assembly is installed and placed in use). None of the references in any way disclose such a load. The *Prewo* reference is entirely silent regarding any such load during a belt manufacturing process.

While the Examiner does not apply the *Baranda, et al.* reference when rejecting claims 2 and 11, it is worth noting again that the only tension explicitly described in the references at issue on appeal is found in the *Baranda, et al.* reference. The only specifically mentioned tension in the references is 50 Newtons (i.e., 50 Kgm/s²). If an elevator system's greatest anticipated load were 50 Kg, that would not be of any use to carry even one passenger. In the case of claims 2 and 11, it is entirely unreasonable to find any support in any of the references for using a load that exceeds an anticipated greatest load that the belt assembly will experience once installed in an elevator system.

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50 Kg certainly does not come anywhere near exceeding a greatest load that an elevator belt assembly will experience upon installation. The weight of the elevator car and counterweight by themselves even without any passengers present far exceeds 50 Kg. There is no basis within the references whatsoever for rejecting claim 2. There is no suggestion or reason for adding a load of the type recited in claims 2 or 11 to the teachings of the *Prewo* reference. The only possible justification for such a modification of the *Prewo* reference would be hindsight reasoning based upon the teachings of Appellant's disclosure and claims. Of course, such reasoning is not permissible when attempting to establish a *prima facie* case of obviousness.

The rejection of claims 2 and 11 must be reversed.

Claim 3 is separately patentable.

There is nothing whatsoever in the *Prewo* reference that comes anywhere near suggesting using a load that is a desired percentage of a breaking strength of the cords when tensioning them sufficiently to stretch the cords. Appellant is the only one to disclose such a technique. There is no basis for the rejection of claim 3 and no *prima facie* case of obviousness.

Claims 4 and 12 are separately patentable.

There is absolutely nothing in the *Prewo* reference or the *Roberts* reference that in any way suggests anything along the lines of tensioning cords using a load corresponding to 10% of a breaking strength of the cords. Without any suggestion whatsoever within the references for using such a load for tensioning cords during a belt manufacturing process, there is no way to establish a *prima facie* case of obviousness. The only possible suggestion for such a load is found in Appellant's disclosure and claims. The rejection of claims 4 and 12 must be reversed.

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PA-000.05025-US**CONCLUSION**

Appellant's claims recite a particular way of making an elevator belt assembly that includes using a tension sufficient to pre-stretch the cords of the assembly to increase their length before the assembly is ever placed in use in an elevator system. The only tension used during a manufacturing process in the cited references does not come close to being sufficient to stretch a cord within an elevator belt. A 50 Kg load is the only tensioning load mentioned in the references relied upon by the Examiner. If a load of that magnitude were sufficient to stretch and lengthen cords used in an elevator belt assembly as recited in Appellant's claims, then the cords would be insufficiently resistant to stretching to make them useful within an elevator system. As pointed out above, the pre-stretching aspects of Appellant's claims are nowhere found or suggested within the cited references. All rejections must be reversed.

Respectfully submitted,

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June 11, 2009
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CERTIFICATE OF FACSIMILE

I hereby certify that this Appeal Brief, relative to Application Serial No. 10/522,191, is being facsimile transmitted to the Patent and Trademark Office (Fax No. (571) 273-8300) on June 11, 2009.


Theresa M. Palmateer

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1. A method of making an elevator belt assembly having a plurality of cords within a jacket, comprising the steps of:
 - (a) aligning the plurality of cords in a selected arrangement;
 - (b) tensioning the cords a selected amount to stretch and increase a length of the cords; and
 - (c) applying a selected jacket material comprising a substantially noncompressible urethane to the cords to encase the cords in the jacket so that the cords remain stretched within the jacket.
2. The method of claim 1, wherein the cords are tensioned using a load that exceeds an anticipated greatest load that the belt assembly will experience once installed in an elevator system.
3. The method of claim 1, wherein the cords are tensioned using a load corresponding to a desired percentage of a breaking strength of the cords.
4. The method of claim 3, wherein the load corresponds to at least approximately 10% of the cord breaking strength.

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6. The method of claim 1, including making the cords using a synthetic material.
7. An elevator belt assembly, comprising:
a plurality of cords that are stretched to an increased length; and
a jacket comprising a substantially noncompressible urethane over the stretched cords that keeps the cords stretched a desired amount without any external load applied to the belt assembly.
8. The assembly of claim 7, wherein the belt assembly has limited elastic stretch.
9. The assembly of claim 7, wherein the cords comprise a synthetic material.
10. The assembly of claim 7, wherein the jacket comprises an ether based polyurethane.
11. The assembly of claim 7, wherein the cords are stretched an amount corresponding to a load that exceeds an anticipated greatest load that the assembly will experience once installed in an elevator system.

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12. The assembly of claim 7, wherein the cords are stretched an amount corresponding to a load that is at least approximately 10% of the cord breaking strength.

13. An elevator belt assembly made by the process, comprising the steps of:

(a) aligning a plurality of cords in a selected arrangement;

(b) stretching the cords by applying a selected amount of tension to increase a length of the cords; and

(c) applying a selected jacket material comprising a substantially noncompressible urethane to the stretched cords to encase the cords in the jacket ;

wherein the cords remain stretched within the jacket without any external load applied to the belt assembly.

14. The assembly of claim 13, wherein the cords comprise a synthetic material.

15. The assembly of claim 13, wherein the jacket material comprises an ether based polyurethane.

16. The method of claim 1, wherein the jacket material comprises an ether based polyurethane.

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EVIDENCE APPENDIX

None.

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RELATED PROCEEDINGS APPENDIX

None.